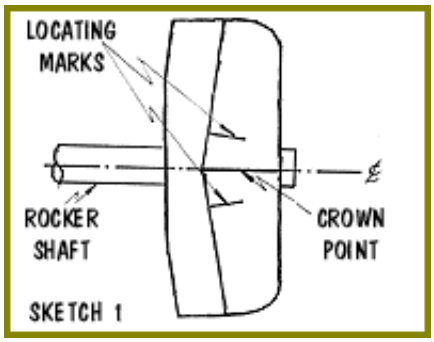
# HAPFO SHARPENING MACHINE (Latest Model)

## Initial Setup

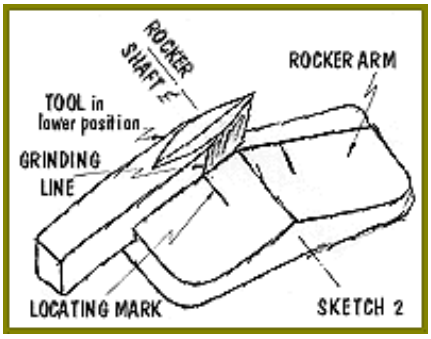
**1**. Ensure the initial setting up is done using a brand new tool, set the tool onto the rocker arm using the clamping wheel (see Setup 3). Loosen the rocker arm stem allen screw and ensure the stem is at the appropriate height. Having placed the new tool in line with the rocker arm indicator (see Set up 2) swing the tool back and forth so that the edge of the tool rubs along the face of the grinding wheel. This should be done with the tool in the upper position – i.e. furthest away from the front position.

Now with the tool in the lower position, once again swing the tool back and forth in order to achieve the same result of the tool rubbing along the face of the grinding wheel. Should this not be exact in each case, it signifies that the tool has NOT been ground at exactly the same angle as the rocker arm recess, and a mean between the two positions must be found. When this has been achieved lock the rocker arm stem allen screw. This should not need to be altered again.

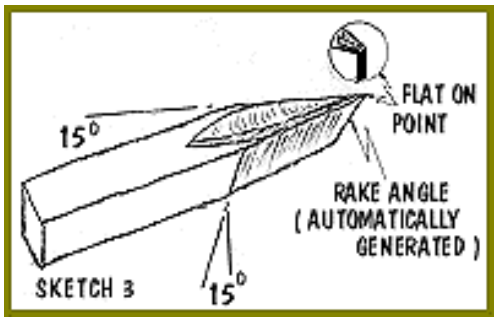
**2.** Locating lines (see *sketch 1*) should be on the rocker arm body and are used to locate the tool on the rocker arm. This is done by ensuring that the grinding line on the tool (see *sketch 2*) is exactly in line with the locating line on the rocker arm. If the lines on the rocker arm are not sufficient, make sure they are well pronounced by using a metal scriber and suitably indent the lines. These two lines should be at equal distances from the crown position on the rocker arm and approx 13mm from the crown.




**3.** Clamping wheels are used to hold the tool tightly onto the rocker arm. These need to be adjusted so that the tool is held square and securely, by raising or lowering the leveling bolt so that the clamping arm is correctly positioned. When this has been achieved the lock nut should be tightened and should not need to be altered again. The above renders the grinding machine usable.



# Tool Sharpening




This page defines the procedure for grinding tools on your HAPFO sharpening machine.

Sketch 3 (opposite) shows the tool angles, but is for information only as they are automatically generated as a result of the above adjustments.

**4.** Clamp the tool onto the rocker arm with the clamping wheel ensuring that the locating line is used to position the tool. The tool is placed in the upper position initially.

***The HAPFO sharpening machine is essential for detailed turnings, and gives the correct angle every time.***

**5**. The tool is then brought into contact with the grinding wheel by using the clutch wheel on the left hand end of the rocker arm shaft. This has the effect of moving the tool either towards or away from the grinding wheel face on rotating the clutch wheel one way or the other since it has small graduations on the shaft. Ensure that when contact of the tool is made with the face of the grinding wheel, only one graduation at a time is used, since it is not good practice to remove too much tool steel at any one time.

At this point it should be appreciated that the tool supplied was originally ground on a large gang grinder, and as a result the face of the cutting edge is flat. The Hapfo grinding machine gives a small hollow ground effect, although this may take some time to achieve, it is well worth the trouble as once achieved it becomes very straight forward to repeat the desired form. It should be stated that no honing ought to be employed, as this will simply remove the cutting edge that has been carefully acquired.

***Clamp in the tool and move across the rotating white wheel for a perfect edge.***

It must also be stressed that equal passes should be carried out on both faces of the tool (that is in both the upper and lower positions), as it is **most important** that the point of the tool remains on the centre line of the tool.

Inspection of the tool will show if the hollow ground effect has been achieved since the total surface of the face having been ground should be clean.

***Remove cutter, clamp in the other side and the repeat the process. A slight flat on the front edge, and the tool is ready for use again.***

Ensure that the movement of the tool across the face of the grinding wheel is slow, since fast movements will not remove tool steel efficiently. However this does have the effect of heating up the tool steel, which, for high speed steel is not desirable. It is not good to quench high speed steel so a compromise must be sought. Only a few passes across the face of the grinding wheel should be used (ideally 3 or 4) before quenching is done. This enables the tool steel to stay relatively cool while at the same time, helping to make sure the temper is not lost.

**6.** In order to gain some indication that the tool steel is **not** being overheated, the colour of the sparks being generated should be observed. They need to remain a yellow colour rather than orange, with the actual spark being large at the end of a long line and not a small spark at the end of a short line.

Under no circumstances should the tool steel be allowed to overheat, as the temper will be lost and the tool may well become unusable. Remember to keep the tool as cool as possible and make the passes over the grinding wheel as slow as practicable. When the correct set up is achieved, future grinding need only take a few passes and the use of quenching may not be required.

**7.** At this point it is essential that the point of the tool is on the centre line of the tool. If this is not the case more grinding needs to be done on the appropriate face to bring back the point of the tool onto the centre line. As a second check a square may be placed on the tool across the faces having been ground, and the grinding lines generated should be level.

It is also reasonable to check the hollow grind at this point, simply to ensure that the overall set up is as desired. This is done by simply applying a straight edge across the face of the ground side and holding it up to the light.

**8.** It is now that the final *trick* is used, in order to achieve that really first class finish. If one has to use very course paper in order to get a good finish on the timber, the tool has been incorrectly ground. Correct grinding ensures less sanding, saving time, but equally as important, giving the operator a safer environment due to less dust.

That *trick* is to give a flat face on the point of the tool which one presents to the timber. It is achieved by turning the tool ninety degrees clockwise with the tool facing away from the operator and the V facing upwards, then with the pointed edge which has just been generated parallel to the side of the grinding wheel a small flat (no more than 1mm at the most) is ground. This gives a tool which is a joy to use, but which will require re-sharpening at regular intervals. It follows that the harder the timber the more regular the tool needs to be sharpened. It should be remembered that the sharper the tool, the better the finish and the less tool steel is being used.